

**SECTION 10428**  
**MBTA LOGO “LOLLIPOP” SIGN**

**PART 1 - GENERAL**

**1.1 DESCRIPTION OF WORK**

- A. Work Included: This Section specifies Massachusetts Bay Transportation Authority (MBTA) logo sign as indicated on the Drawings and specified herein. All modes of transport requiring a logo sign will use this specification to maintain consistency of appearance.
- B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
  - 1. Section 05500 - MISCELLANEOUS METALS; Frames and supports not integral with signage.
  - 2. Section 10401 - METAL SIGN FRAMES
  - 3. Division 16 - ELECTRICAL; Signs.
- C. Permits: Obtain permits required by Local Authorities for installation of signs. Submit (1) hard copy of all permits to Engineer.

**1.2 GRAPHICS**

- A. MBTA logo dimensions can be found in MBTA 2013 Logo Sign Guidelines and must be followed to ensure consistency. MBTA logo graphics can also be provided by MBTA Capital Delivery Department.

**1.3 PERFORMANCE REQUIREMENTS**

- 1. Design Criteria: Design, fabricate, and install sign items to withstand normal exposure to weather, temperature variation, wind loads and building movement; provide units resistant to vandalism and theft.
- 2. Field Measurements: Check actual locations of construction - to which metal fabrications must fit - by accurate field measurements before fabrication; show recorded measurements on final shop drawings prior to fabrication
- 3. Thermal Movements: Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in engineering, fabricating, and installing signs to prevent buckling, opening of joints, over stressing of components and connections, and other detrimental effects. Base engineering calculation on actual surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.

- a. Temperature Change (Range): 0 - 180 deg F ambient, material surfaces.
4. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

#### **1.4 SUBMITTALS**

- A. All submittals shall be provided to both the Designer of Record and MBTA Capital Delivery Department for review; disposition and documentation management will be provided by the MBTA Capital Delivery Department.
- B. Product Data: Manufacturer's product data, any limitations and recommendations for each material used, installation instructions, and manufacturer's certification (stating that materials comply with requirements) for the Designer of Record and MBTA Capital Delivery Department's review and approval.
- C. Shop Drawings: Provide shop drawings for fabrication and installation of logo sign including mounting. Provide plans, elevations, and details of anchorage, connections and accessory items. Provide installation templates for work installed by others. Provide four copies of shop drawings for action by the Designer of Record and MBTA Capital Delivery Department. After action, provide two copies of shop drawings on which action has been taken for Designer of Record and MBTA Capital Delivery Department's records.
- D. Sign Schedules: Submit complete Sign Schedule for logo sign. Use same designation as on the Drawings.
- E. Samples for Approval: Sample Submittals are in addition to quantities shown in sign schedule. They are record project samples to be kept on file at the Designer's office.
  1. Paper Proofs: Provide proofs for logo sign including half-size elevation sample of the entire logo sign.
  2. Submit 3" x 4" samples of polycarbonate lens material in white and black colors.
  3. Approval of all proofs is required from the Designer of Record and the MBTA Capital Delivery Department prior to final sign production.
  4. Color samples and paper proofs will be resubmitted until they meet quality standards outlined in the next section.
  5. Provide samples and proofs to the Designer of Record and MBTA Capital Delivery Department at no extra charge.

## **1.5 QUALITY ASSURANCE**

- A. MBTA Reference Standard: Comply with the MBTA Logo Sign Guidelines. A copy will be available on request from the MBTA Capital Delivery Department.
- B. Reference Standards: The work shall conform to the codes and standards of the following agencies as further cited herein:
  - 1. ADAAG: Americans with Disabilities Act Accessibility Guidelines
  - 2. ANSI: American National Standards Institute
  - 3. ASTM: American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103 as published in "Compilation of ASTM Standards in Building Codes"
  - 4. MAAB: Massachusetts Architectural Access Board
  - 5. Structural Code:
    - a. Latest edition of the Massachusetts State Building Code
    - b. AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals
    - c. Latest edition of NFPA 70 National Electrical code
- C. The Lollipop Sign shall be certified as UL listed and have affixed to the sign the UL Certification Listing Mark and all required markings.
- D. Accessibility: The ADAAG and the MAAB regulations are pertinent to the design and installation of items covered under the work of this Section. When guidelines conflict, the guideline giving greater access shall be applicable, however written approval must be obtained by the Designer of Record and the MBTA Capital Delivery Department
- E. Qualifications: The approved manufacturer shall have minimum of 5 years of successful experience with similar work, shall have a reputation for doing satisfactory work on time
- F. Welding Standards: Comply with applicable provisions of the American Welding Society AWS D1.1 "Structural Welding Code."
  - 1. Certify that welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.
- G. Coating Applicator Qualifications: must be experienced in successfully applying specified coatings of the type indicated to specified materials, and equipped with the following:
  - 1. Application equipment required to apply a uniform coating as recommended by the coatings manufacturer.
- H. Engineering: Design, engineering and structural analysis for the Lollipop Sign and supports, as well as necessary calculations, shall be prepared under the supervision of, and signed and sealed by, the Designer of Record. These calculations shall include gravity, wind, and seismic loading. The

internal structure, dimensions and specifications for all items shall be indicated in the Contract drawings, and shall be indicated in the Contractor's shop drawings. The Designer of Record shall engineer signs to a proper level to withstand abuses of their environment.

- I. Coordination: The work in this Section shall be completely coordinated with the work of other Sections. Verify dimensions and work of other trades that adjoin materials of this Section before the installation of items herein specified. Cooperate with such trades to assure the steady progress of all work under this Contract.
- J. Hold Points: Completed logo sign shall be available for inspection for two weeks prior to installation, with notification given to the Designer of Record and MBTA Capital Delivery Department.  
If Designer of Record and MBTA Capital Delivery Department determines sign does not comply with requirements, provide new logo sign until it is approved.
- K. Project Meetings: The signage contractor and related subcontractors shall be required to attend project meetings at the Project site when required by the Designer of Record and MBTA Capital Delivery Department.
- L. Certification: Submit manufacturer's certification that materials furnished comply with requirements specified.
- M. Maintenance Instructions: Submit manufacturer's printed instructions for maintenance of each sign installed to the MBTA, including precautions for use of cleaning materials and solvents for paint removal, which could damage surfaces.
- N. Warranty:
  - 1. Submit a written Manufacturer's warranty for the MBTA acceptance, signed by the manufacturer, agreeing to repair or replace lenses that fail during specified warranty period. Failures include, but not limited to, the following:
    - a. Coating degradation
    - b. Chipping, chalking, fogging or discoloration.
    - c. Fading.
    - d. Structural failure.
    - e. Delamination of applied graphics.
    - f. Delaminating or degradation of applied anti-graffiti coatings.
  - 2. The manufacturer's warranty is in addition to, and not a limitation of, other rights the  
MBTA may have under the Contract Documents.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- A. Deliver and store work under this Section in a manner to prevent cracking or stress of components and to prevent mechanical damage or damage by the elements.

- B. Deliver work under this Section to Site in ample time to avoid delay in job progress and at such times as to permit proper coordination of the various parts.
- C. Installation of this work until near time of Substantial Completion.
- D. Handle signs carefully to prevent breakage, surface abrasion, denting, soiling, and other defects.  
 Comply with the manufacturer's written handling instructions for unloading components subject to damage. Inspect sign components for damage on delivery.
  - 1. Do not install damaged sign components.
  - 2. Repair minor damage to signs, provided the finished repair is equal in all respects to the original work and is approved by MBTA in writing; otherwise, remove and replace damaged sign components as directed and without exception.

## **1.7 PROJECT CONDITIONS**

- A. Inspection of Site: The Contractor shall visit the site of the proposed work and become fully acquainted with existing conditions, and to become fully informed as to the facilities involved and the difficulties and restrictions attending the performance of the Contract, prior to submitting a price quotation.
- A. Substrates: Proceed with work of this Section only when substrate construction and penetration work have been completed.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Logo "Lollipop" Sign: Each sign will be shop fabricated by the contractor off-site and delivered and installed at the locations as shown on the Drawings.
- B. Lens: The lens shall be Solar Grade, vacuum-formed, UV resistant, high-impact polycarbonate convex sheets with 2 ½" bow. The polycarbonate shall be ¼" in thickness. The lens shall be white with a black "T" on the surface on both exterior sides. The black "T" logo shall be embossed such that it protrudes .375" out from the white background.
- C. Structural Steel:
  - 1. The sign's post shall be a schedule 80 steel pipe, with an outer diameter of 3.5" and an inner diameter of 2.90". The pipe will be welded to steel gusset plate and steel base plate.

2. The frame shall be a C4 x 5.4 steel rolled channel with ¼" weep holes, and opening wide enough for the pipe. The channel will be bent and welded to form a circle with the flange on the outside.
3. The sign frame and support shall be shop painted steel.
  1. As shown on the contract drawings.
  2. Materials in accordance with 05500 Misc Metals.

D. Sign Connections:

1. Logo sign attached and or supported as shown on the Drawings. Supports and connections as specified in section 05500 Misc Metals.
2. Continuously weld joints and seams unless other methods are indicated; grind, fill, and dress welds to produce smooth, flush, exposed surfaces with welds invisible after final finishing.
3. Logo sign pipe will be secured in Portland cement concrete or bituminous concrete sidewalks or other rigid surfaces and shall be in accordance with the Drawings. Any leveling of the sign baseplate to the concrete sub-base should be filled with a pourable cementitious, non-shrink grout.
4. The polycarbonate lens will be mechanically fastened to the frame with two half-circle angle long leg in aluminum ring frame, for each sign face.
5. Neoprene sponge between channel ring frame and lens shall conform to ASTM D1056, Type 2, Class C, Grade 2.
6. The steel pipe will connect to the circular channel ring frame by sliding the pipe through hole cut at base of the channel ring. Two steel angle clips welded to the interior of the channel ring at the top and two at the bottom will be mechanically fastened to the pipe.
7. All hardware shall be as indicated on drawings.

D. Hardware:

1. Anchors and Inserts: Use non-ferrous metal or hot-dipped galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. High strength bolts other than anchor bolts, nuts and washers shall conform to ASTM-A325.
2. Tamper resistant fasteners to be stainless steel, 3/8" dia. button head Phillips socket pinhead.
3. Threaded studs shall be low carbon mild steel with a minimum yield strength of 50,000 PSI.
4. All hardware shall be as indicated on drawings: 316 stainless steel, or galvanized per ASTM-A153 requirements.
5. Where mechanical fasteners and hardware are required, they shall be of adequate thickness, length and construction to properly secure the sign.
6. Welding Electrodes and Filler Metal: Type and alloy of filler metal and electrodes as recommended by producer of metal to be welded,

complying with applicable AS specifications, and as required for color match, strength, and compatibility in the fabricated items.

7. Galvanizing Repair Paint: High zinc dust content paint for re-galvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, complying with DOD- P-21035 or SSPC-Paint 20.

E. Coatings: The logo sign frame, post, and anchors shall all receive the Exterior Ferrous Metal, Urethane system as specified in section 09900. Finish will be color semi-gloss black.

F. Electrical:

1. Electrical wire shall be #10 and be a 3 wire system.
2. Conduit shall be rigid galvanized steel.
3. Twelve Light-Emitting Diode (LED) shall be 5000K. Power supply shall be 277volt or 120volt, depending on site conditions, damp rated. The LEDs will be tacked to two 3" wide steel sheet metal channels placed in the inside of the steel channel ring to either side of the pipe. These two channels will be bent with flanges out (opposite of channel ring frame bend), so that the wiring will fit between the steel sheet metal channel and the channel ring frame. See drawings for clarification.

## **2.2 FABRICATION**

- A. Precisely form work to sizes, shapes, and profiles indicated on approved shop drawings.
- B. Any material defects or damage due to shipment will be repaired or replaced by the supplier.

## **PART 3 - EXECUTION**

### **3.1 INSPECTION**

- A. The Installer shall examine substrates, supports, and conditions under which this work is to be performed and notify Contractor, in writing, of conditions detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected. Beginning work means Installer accepts substrates and conditions.
- B. Notification Point: The Designer of Record and MBTA Capital Delivery Department will be given 72 hour notice to perform field inspection at the start of installation of signage. If work does not meet project requirements, contractor must remove and replace deficient work.

### **3.2 INSTALLATION/APPLICATION/ERECTION**

- A. Strictly comply with approved shop drawings and manufacturer's instructions and recommendations, except where more restrictive requirements are specified in this Section.
- B. Install LED lighting in accordance with manufacturer's instructions.
- C. Install sign plumb, level, in true plane and alignment. Provide logo sign where shown or scheduled using mounting methods indicated.
- D. Protect adjacent or adjoining surfaces and work from damage during installation in this Section.
- E. Work shall be designed and anchored so that work will not be distorted nor the fasteners overstressed from expansion and contraction of metal or other materials as applicable.
- F. Verify all electrical wiring and connections are secure and protected.

### **3.3 TOLERANCES**

- A. The following allowable installed tolerances are allowable variations from locations and dimensions indicated by the Contract Document and shall not be added to allowable tolerances indicated for other work:
  - 1. Allowable Variation from True Plumb, Level and Line: Plus or minus 1/16 inch from true position for signage smaller than 24 by 24 inches in size; plus or minus 1/8 inch from true position for signage 24 by 24 inches in size and larger.
  - 2. Allowable Variation from True Plane of Adjacent Surfaces: Plus or minus 1/16 inch.

### **3.4 CLEANING AND PROTECTION**

- B. Adjust work to present the best possible appearance. Touch-up damaged finishes and eliminate any evidence of repair. Clean exposed surfaces using materials and methods recommended by manufacturer of material or product being cleaned. Remove and replace work that cannot be successfully repaired or cleaned.
- A. Provide temporary protection to ensure work being without damage or deterioration at time of final acceptance. Remove protections and reclean as necessary immediately before final acceptance.
- B. Manufacturer shall provide Authority with information on cleaning and maintenance recommendations for logo sign.



- C. Names, stamps and decals of manufacturers, installers or maintainers of signs shall not be visible in the finished work.

## **PART 4 - MEASUREMENT AND PAYMENT**

### **4.1 MEASUREMENT**

- A. Logo sign will be measured as per each complete in place, including all preparation, accessories and incidentals.

### **4.2 PAYMENT**

- A. Payment for sign will be made at the Contract unit price for the quantities as specified above.

### **4.3 PAYMENT ITEMS**

ITEM NO.	DESCRIPTION	UNIT
1048.022	MBTA "LOLLIPOP" LOGO SIGNS	LUMP SUM

**END OF SECTION**